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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/888,256	06/22/2001	Glen E. Howard	004978 USA/ETEC/RWM	8744
21861	7590	04/02/2004	EXAMINER	
JANAH & ASSOCIATES A PROFESSIONAL CORP 650 DELANCEY STREET SUITE 106 SAN FRANCISCO, CA 941072001			PHAM, HAI CHI	
			ART UNIT	PAPER NUMBER
			2861	

DATE MAILED: 04/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/888,256

Applicant(s)

HOWARD ET AL.

Examiner

Hai C Pham

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,5-10,14-19,22-31,34-40 and 43-50 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10,14-18,23-31,34-38,40 and 43-50 is/are allowed.
- 6) ☒ Claim(s) 1,5,7,9,19,22 and 39 is/are rejected.
- 7) ☒ Claim(s) 6 and 8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Allowable Subject Matter***

1. The indicated allowability of claims 1, 5, 7, 9 is withdrawn in view of the new rejection of the claims based on Davis (U.S. 5,942,834) and the newly reference in Matsumoto et al. (JP 06-181029). Rejections based on the newly cited reference follow.

### ***Claim Objections***

2. Claim 44 is objected to because of the following informalities:

- Line 8, "comprising consisting" should read --consisting--.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 19 is rejected under 35 U.S.C. 102(b) as being anticipated by Davis (U.S. 5,942,834).

Davis discloses a method for generating electrons from an electron source used in a thermionic electric converter, the electron source comprising an anode (206), a cathode (220) having an electron emitting portion, the method comprising negatively

biasing the cathode relative to the anode (col. 4, lines 55-67), and heating the cathode by directing an electromagnetic radiation beam onto the cathode (the cathode being heated by a heat source, which can be a laser) (see col. 6, lines 41-43).

Davis further teaches the cathode can have any desired shape such as the cathode (20) of the conventional electron gun (10) shown in Fig. 1, wherein the cathode has a concave beam receiving portion (the side facing the heating means 48) and an electron emitting portion (the inside face of the cathode with respect to the device).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 5, 7, 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis in view of Matsumoto et al. (JP 06-181029).

Davis discloses a method for generating electrons from an electron source used in a thermionic electric converter, the electron source comprising an anode (206), a cathode (220) having an electron emitting portion, the method comprising negatively biasing the cathode relative to the anode (col. 4, lines 55-67), and heating the cathode at least about 1800 Kelvin by directing an electromagnetic radiation beam onto the cathode (the cathode being heated by a heat source, which can be a laser) (see col. 6, lines 41-43).

Davis further teaches the cathode can have any desired shape such as the cathode (20) of the conventional electron gun (10) shown in Fig. 1, where the beam receiving portion of the cathode is concave.

However, Davis fails to teach the lens adapted to direct the electromagnetic radiation beam onto the beam receiving portion of the cathode, and the lens axis being parallel to the cathode axis.

Regardless, Matsumoto et al. discloses a laser heating mechanism for the cathode of an electron gun, the mechanism including a laser source for emitting a laser beam (7) and a lens system (10) for condensing the laser beam onto the cathode (1) for heating, the lens system being disposed such that the optical axis of the lens and that of the cathode are coincided.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate a lens system as taught by Matsumoto et al. in the device of Davis. The motivation for doing so would have been to allow the laser beam to be condensed onto the beam receiving portion of the cathode during heating.

With regard to claims 5, 7, Davis further teaches that the cathode can be made of tungsten wire (Fig. 4), and that the cathode would be normally held at 1800 degrees Kelvin (col. 2, lines 6-8).

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7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Davis in view of Matsumoto et al., as applied to claim 1 above, and further in view of Nayama et al. (JP 5-159694).

Davis, as modified by Matsumoto et al., discloses all the basic limitations of the claimed invention except for the detection of a radiation reflected from the cathode for determining a property of the cathode.

Nayama et al. discloses a laser heater controller for the electron gun cathode (1) comprising a laser oscillator (6) radiating a laser beam (7) to heat the cathode of the electron gun through an incident optical system (8), a temperature measuring instrument (13) for detecting the temperature/property of the cathode by detecting the radiation light reflected from the cathode, and a temperature controller (14) for monitoring and stabilizing the heating of the cathode.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the modified device of Davis with the aforementioned teaching of Nayama et al. The motivation for doing so would have been to produce a stable output of electron beams as suggested by Nayama et al.

8. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Davis in view of Nayama et al.

Davis discloses all the basic limitations of the claimed invention except for the detection of a radiation reflected from the cathode for determining a property of the cathode.

Nayama et al. discloses a laser heater controller for the electron gun cathode (1) comprising a laser oscillator (6) radiating a laser beam (7) to heat the cathode of the electron gun through an incident optical system (8), a temperature measuring instrument (13) for detecting the temperature/property of the cathode by detecting the radiation light reflected from the cathode, and a temperature controller (14) for monitoring and stabilizing the heating of the cathode.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Davis with the aforementioned teaching of Nayama et al. The motivation for doing so would have been to produce a stable output of electron beams as suggested by Nayama et al.

***Allowable Subject Matter***

9. Claims 10, 14-18, 23-31, 34-38, 40, and 43-50 are allowed.
10. Claims 6 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
11. The following is an examiner's statement of reasons for allowance: claims 10, 31, 44 are patentable over the prior art patents and printed publications because of the specific electron beam modulator and scanner for modulating and scanning the electron beam across the substrate to register an electron beam pattern on the substrate used with the claimed electron beam apparatus, which is not taught by the art of record alone or in combination.

Claims 6, 23, 34, 35 are patentable over the prior art patents and printed publications because of the specific rod supporting the condenser lens, the rod being disposed parallel to the cathode axis and terminating in the electron emitting portion of the cathode, which is not taught by the art of record alone or in combination.

Claims 36, 43, 45 are patentable over the prior art patents and printed publications because of the specific shaped of the cathode as having a tapered tip for emitting electron as well as the negatively bias of the cathode generating a localized electric field at the tapered tip of the cathode. The combined limitations are not taught by the art of record alone or in combination.

Claim 37 is patentable over the prior art patents and printed publications because of the specific shaped of the cathode as having a tapered tip for emitting electron as well as the provision of the thermostat to determine a temperature of the cathode. The combined limitations are not taught by the art of record alone or in combination.

Claim 38 is patentable over the prior art patents and printed publications because of the specific shaped of the cathode as having a tapered tip for emitting electron, which is not taught by the art of record alone or in combination.

Claims 14-18, 24-30, 40, 46-50 are allowed because they are directly or indirectly dependent from the aforementioned base claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."



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***Response to Arguments***

12. Applicant's arguments with respect to claims 1, 5, 7, 9, 19, 22 and 39 have been considered but are moot in view of the new grounds of rejection presented in this Office action.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



HAI PHAM  
PRIMARY EXAMINER

March 31, 2004